

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the Application. No new matter has been introduced by way of the claim amendments. Current additions to the claims are noted with underlined text. Current deletions from the claims are indicated by text ~~striketrough~~ or [[double bracketing]]. The status of each claim is indicated in parenthetical expression following the claim number.

WHAT IS CLAIMED IS:

1. (Previously Amended) A device for measuring mechanical conditions, wherein the device comprises:
 - a sensing element comprising a plurality of carbon nanotubes; and
 - an electrical probe in contact with the plurality of carbon nanotubes;
 - wherein the electrical probe is sensitive to an electrical property of the carbon nanotubes in a measureable way.
2. (Currently Amended) The device of Claim 1, further comprising:
 - computational hardware and software; and
 - an accessible database of information which correlates the electrical property to the mechanical conditions in a quantifiable manner based upon previously measured standards.
3. (Original) The device of Claim 1, wherein the electrical probe is a four-point probe.
4. (Previously Amended) The device of Claim 1, wherein the electrical property is selected from the group consisting of conductivity, resistivity, conductance, resistance, and combinations thereof.
5. (Original) The device of Claim 1, wherein the mechanical conditions are selected from the group consisting of displacement, impact, stress, strain, and combinations thereof.
6. (Original) The device of Claim 1, wherein the carbon nanotubes are selected from the group consisting of single-wall carbon nanotubes, multi-wall carbon nanotubes, double-wall carbon

nanotubes, carbon fibrils, buckytubes, fullerene tubes, vapor-grown carbon fibers, and combinations thereof.

7. (Previously Amended) The device of Claim 1, wherein the carbon nanotubes have been refined to a desired level of property homogeneity, wherein the property homogeneity is selected from the group consisting of uniform diameter, uniform length, uniform chirality, and combinations thereof.
8. (Previously Amended) The device of Claim 1, wherein the carbon nanotubes have been chemically modified through a modification selected from the group consisting of covalent bonding, ionic bonding, chemisorption, intercalation, surfactant interactions, polymer wrapping, cutting, solvation, and combinations thereof.
9. (Previously Amended) The device of Claim 1, wherein the plurality of carbon nanotubes comprises a form selected from the group consisting of an array, a mat, a bucky-paper, and combinations thereof.
10. (Original) The device of Claim 1, wherein the carbon nanotubes are incorporated into a matrix material.
11. (Original) The device of Claim 1, wherein the carbon nanotubes are attached to a material.
12. (Previously Amended) The device of Claim 1, wherein the device is incorporated into an article of manufacture.
13. (Previously Amended) The device of Claim 12, wherein the article of manufacture is selected from the group consisting of airplanes, automobiles, engines, spacecraft, buildings, bridges, dams, and gaskets.
14. (Previously Amended) The device of Claim 1, wherein the device is attached to an article of manufacture.
15. (Previously Amended) The device of Claim 14, wherein the article of manufacture is selected from the group consisting of airplanes, automobiles, engines, spacecraft, buildings, bridges, dams, and gaskets.

16. (Previously Amended) The device of Claim 1, wherein the plurality of carbon nanotubes are arranged in a two-dimensional network.
17. (Previously Amended) The device of Claim 1, wherein the plurality of carbon nanotubes are arranged in a three-dimensional network.
18. (Original) A method of measuring mechanical conditions comprising:
 - selecting a plurality of carbon nanotubes;
 - attaching to the carbon nanotubes an electrical probe;
 - exposing the carbon nanotubes to a mechanical condition;
 - measuring a change in an electrical property of the carbon nanotubes with the electrical probe;
 - comparing this electrical property change to a database which correlates electrical property changes with mechanical conditions in a quantifiable manner; and
 - assigning a value to this mechanical condition based on this comparison.
19. (Original) The method of Claim 18, wherein the carbon nanotubes make up a sensing element that optionally comprises other materials selected from the group consisting of glass fibers, ceramic fibers, polymers, polymeric fibers, carbon fibers, nanotube fibers, spherical particles, and combinations thereof.
20. (Original) The method of Claim 18, wherein the electrical probe is a four-point probe.
21. (Original) The method of Claim 18, wherein the electrical probe measures a property selected from the group consisting of conductance, conductivity, resistance, resistivity, and combinations thereof.
22. (Original) The method of Claim 18, wherein the mechanical conditions are selected from the group consisting of displacement, stress, strain, and combinations thereof.
23. (Original) The method of Claim 18, wherein the carbon nanotubes are selected from the group consisting of single-wall carbon nanotubes, multi-wall carbon nanotubes, double-wall carbon nanotubes, carbon fibrils, buckytubes, fullerene tubes, vapor-grown carbon fibers, and combinations thereof.

24. (Original) The method of Claim 18, wherein the carbon nanotubes are in a form selected from the group consisting of an array, a mat, a buckypaper, and combinations thereof.
25. (Original) The method of Claim 18, wherein said method is used to sense mechanical conditions selected from the group consisting of displacement, impact, stress, strain, and combinations thereof.
26. - 61. (Cancelled)
62. (Previously Presented) The device of Claim 1, wherein the carbon nanotubes have been physically modified.